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09/588,008	06/06/2000	Sam Yang	M4065.0210/P210	9015

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EXAMINER

TRINH, HOA B

ART UNIT PAPER NUMBER

2814

DATE MAILED: 07/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/588,008

Applicant(s)

YANG ET AL.

Examiner

Vikki H Trinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on 20 March 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-31,97 and 98 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31,97 and 98 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

**Claim Rejections - 35 USC § 102**

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

It is well settled that the law of anticipation does not require that the reference teach what appellant is teaching or has disclosed, but only that the claims on appeal "read on" something disclosed in the reference, i.e., all limitations of the claims are found in the reference. See *Kalman v. Kimberly Clark Corp.*, 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1083). Moreover, it is not necessary for the applied reference to expressly disclose or describe a particular element or limitation of a rejected claim word for word as in the rejected claim so long as the reference inherently discloses that element or limitation. See, for example, *Standard Havens Products Inc. v. Gencor Industries Inc.*, 953 F.2d 1360, 21 USPQ2d 1321 (Fed. Cir. 1991).

2. Claims 1-31, 98 are rejected under 35 U.S.C. 102(e) as being anticipated by Agarwal et al. (6,297,527).

With respect to claim 1, Agarwal et al. (6,297,527) discloses a capacitor 240, 340 having a bottom conducting layer 74, 76, 78, 80, a dielectric layer 72 and an "annealed" top conducting layer 70 having oxygen permeable material (Pt is an example of the material). (See figure 1 and column 5, lines 15-40, and column 6, lines 35-60.)

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As to claims 2-3, 15, wherein the bottom conducting layer 74 is formed of a material layer selected from a "noble" metal group, ie Pt. (See figure 1 and column 2, lines 9-20, column 5, lines 15-40.)

As to claim 4, wherein the bottom conducting layer 76 is formed of metal alloy. See column 5, lines 28-40. (See figure 1 and column 5, lines 15-40.)

As to claims 5-8, 18-28, wherein the bottom conducting layer 76, 78, 80 is formed of a conducting metal oxide, metal nitride (i.e., Pt (noble metal), Titanium nitride, PtRh, silicide). (See column 7, lines 15-58, and column 8, lines 1-5.)

As to claim 9, the bottom layer is on top of the oxygen barrier. (see column 8, lines 1-5)

As to claim 10, the dielectric layer 72 is a dielectric metal oxide layer. (see column 6, lines 33-40)

As to claims 11-14, the dielectric constant of titanium pentoxide overlaps the range of the claimed claim, 7-300. (See column 6, lines 33-40)

As to claim 16, the top layer 70 is formed of a non-oxidizing metal permeable to oxygen. See column 5, lines 15-20.

As to claim 17, the top layer may be formed of a metal oxide. See column 5, lines 15-20.

As to claim 29, the capacitor is a stacked capacitor. See column 7, lines 65-68).

As to claim 30, an access transistor 52 connected to the capacitor. See figure 1.

As to claim 31, the capacitor is a DRAM cell. See column 1, lines 4-16).

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claim 97 is rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal et al. (6,297,527) in view of Li et al. (6,489,199)

Agarwal et al. (6,297,527) discloses the invention substantially as claimed. However, Agarwal et al. (6,297,527) does not explicitly state that the bottom layer is formed from tungsten nitride.

Li et al. (6,489,199) discloses a capacitor having top layer 192, a dielectric layer 191, and a tungsten nitride bottom layer 187. See figure 2D and column 11, lines 32-34.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Agarwal et al. (6,297,527) with the tungsten nitride bottom

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layer, as taught by Li et al. ( 6,489,199), so as to prevent diffusion from adjacent material. See Li et al., column 1, lines 43-45.

*Response to Arguments*

5. Applicant's arguments filed 09/04/02 have been fully considered but they are not persuasive.

In the remarks on page 4, 3rd paragraph, applicant alleges that "there is no teaching anywhere in Agarwal for an annealed layer". Moreover, Applicant conveniently argues that Agarwal simply "teaches that the upper electrode 70 may be a 'single layer of suitable material...or may have a multiplayer structure identical to that of the lower electrode with a platinum layer and a platinum-rhodium layer' " (applicant's citing col. 6, lines 49-54; figure 2). On the contrary, Agrawal does teach each and every elements of the present claims. In particular, applicant is directed to column 6, lines 54-56, where Agarwal's invention includes heat treatment that indeed applies to the top layer 70. Furthermore, had applicant carefully read column 6, lines 40-48, applicant would also have learned that the heat treatment applies to the dielectric layer 72 by exposing it to a high temperature. Thus, applicant's response does not overcome the rejection for claims 1-31, and claim 98.

Turning to claim 97, applicant argues that Agarwal has at least two layers for the lower electrode, while the present invention directs to a single layer. The examiner notes that applicant drafts the preamble of the present claim with the term "comprising" which is an open-end term. Thus, the present claim does not limit itself to a single layer. Therefore, Agarwal meets the present claim language.

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Applicant also argues for claim 97 that “Li is not properly combinable with Agarwal because the cited references are directed to solving completely different problem”. (Remarks, 3<sup>rd</sup> paragraph) On the contrary, the cited references are analogous art, and they both teach a capacitor for a semiconductor device. Thus the reference Li is used to cure the deficiency in Agarwal.

For the reasons above, the examiner’s rejection in the previous office action is proper. The newly proposed amendment does not overcome the cited references.

### ***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Vikki Trinh whose telephone number is (703) 308-8238. The Examiner can normally be reached Mon-Tuesday, Thurs-Friday, 7:30 AM - 6:00 PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the Examiner’s

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supervisor, Mr. Wael Fahmy, can be reached at (703) 308-4918. General inquiries relating to the status of this application should be directed to the Group receptionist at (703) 308-0858. The fax number is (703) 308-2708.

Vikki Trinh,  
Patent Examiner  
AU 2814



LONG PHAM  
PRIMARY EXAMINER